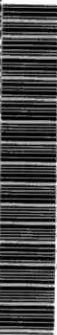


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Drinking Water Surveillance Program

NORTH BAY WATER SUPPLY SYSTEM

Annual Report 1987

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**Environment
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Jim Bradley, Minister

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**NORTH BAY
WATER TREATMENT PLANT**

**DRINKING WATER SURVEILLANCE
PROGRAM**

ANNUAL REPORT 1987

**ONTARIO MINISTRY OF ENVIRONMENT
OCTOBER 1988**

c Queen's Printer for Ontario, 1988

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ACKNOWLEDGEMENTS

The Drinking Water Surveillance Program (DWSP) employs a team approach requiring the co-operative effort of the Ministry of the Environment (MOE) staff from Water Resources and Laboratory Services Branch and the Regions, as well as plant operational staff from the Municipalities.

This annual report was produced by the DWSP Group (Ron Hunsinger, Peter Bohm, Carol Sackville-Duyvelshoff, Chris Fung and John McGrachan) and by Pat Lachmaniuk (on developmental assignment to the Drinking Water Section).

Helpful input and reviews were received from Drinking Water Section Staff, in addition to reviews by other MOE and municipal personnel.

EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

NORTH BAY WATER SUPPLY 1987 ANNUAL REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored.

The North Bay Water Treatment Plant is a pumping station that disinfects and fluoridates water from Trout Lake before distribution. This plant serves a population of approximately 50,000 people and has a design capacity of 24 x 1000m³/day.

Water samples from two distribution sites were taken on a monthly basis and analyzed for approximately 160 parameters beginning in March. Parameters were divided into the following groups: Bacteriological, Inorganic and Physical (Laboratory Chemistry, Field Chemistry and Metals) and Organics (Chloroaromatics, Chlorophenols, Pesticide and PCB, Phenolics, Polynuclear Aromatic Hydrocarbons, Specific Pesticides and Volatiles). Phenolics, Polynuclear Aromatic Hydrocarbons and Chlorophenols were not analysed for.

A summary of results is shown in Table 1.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality of water; however routine bacteriological monitoring as outlined in the Ontario Drinking Water Objectives (ODWOs) is carried out by the operating authority. Coliforms were present once at one distribution site. In terms of the limited DWSP bacteriological examination the water was of good quality.

Inorganic and Physical parameters (Laboratory Chemistry, Field Chemistry and Metals) were below any applicable health related ODWOs.

Of approximately 110 Organic parameters tested for on a monthly basis, none exceeded health related guidelines.

Many of the substances detected are naturally occurring or treatment by-products.

During 1987 the DWSP sampling results indicated that the distributed water from the North Bay Water Treatment Plant was a good quality water.

SOMMAIRE

PROGRAMME DE SURVEILLANCE DE L'EAU POTABLE

RÉSEAU D'ALIMENTATION EN EAU DE NORTH BAY RAPPORT ANNUEL 1987

Le Programme de surveillance de l'eau potable (PSEP) de l'Ontario fournit des informations immédiates, fiables et à jour sur la qualité de l'eau potable. Le PSEP a débuté officiellement en avril 1986. Il est destiné à englober tous les réseaux municipaux d'alimentation en eau de l'Ontario. Actuellement, 44 stations en font partie.

La station d'épuration de North Bay est une station de pompage qui assure la désinfection et la fluoration de l'eau du lac Trout avant la distribution. La station dessert une population d'environ 50 000 habitants et a une capacité nominale de 24 x 1 000 m³/jour.

Des prélèvements en deux points du réseau de distribution ont été effectués chaque mois et, à partir de mars, analysés par rapport à environ 160 paramètres dans les catégories suivantes : bactériologique, inorganique et physique (analyses en laboratoire et sur place, présence de métaux) et organique (composés aromatiques chlorés, chlorophénols, pesticides et BPC, dérivés phénoliques, hydrocarbures aromatiques polynucléaires, pesticides particuliers et composés volatils). On n'a pas recherché la présence de dérivés phénoliques, d'hydrocarbures aromatiques polynucléaires ni de chlorophénols.

Le tableau 1 résume les résultats obtenus.

En raison de la fréquence des prélèvements (un par mois), le PSEP ne permet pas d'évaluer tous les aspects de la qualité bactériologique de l'eau. Cependant, comme on le recommande dans le cadre des objectifs relatifs à la qualité de l'eau potable en Ontario, un contrôle bactériologique systématique est effectué par l'exploitant. Des coliformes étaient présents une fois dans l'échantillon d'un des deux sites. L'analyse bactériologique limitée du PSEP a révélé une eau de bonne qualité.

Les mesures des paramètres inorganiques et physiques (analyses en laboratoire et sur place, présence de métaux) étaient inférieures aux limites applicables fixées par l'Ontario pour l'eau potable.

Pour environ 110 paramètres organiques mesurés chaque mois, aucun résultat n'a dépassé les limites acceptables fixées pour la santé.

Un grand nombre de substances détectées apparaissent naturellement ou sont des produits dérivés de l'épuration.

Les résultats des analyses effectuées en 1987 dans le cadre du PSEP ont indiqué que l'eau distribuée par la station d'épuration de North Bay était une eau de bonne qualité.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SUMMARY TABLE BY SCAN (1987)

SCAN	SITE 1			SITE 2		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	30	8	26	38	15	39
CHEMISTRY (FLD)	89	89	100	89	89	100
CHEMISTRY (LAB)	291	262	90	289	258	89
METALS	317	161	50	351	155	44
CHLOROAROMATICS	104	0	0	104	0	0
PESTICIDES & PCB	203	0	0	203	0	0
SPECIFIC PESTICIDES	81	0	0	81	0	0
VOLATILES	252	29	11	252	32	12
TOTAL	1367	549		1407	549	

COLIFORMS WERE PRESENT ONCE IN THE DISTRIBUTION SYSTEM. NO OTHER HEALTH RELATED GUIDELINES/LIMITS WERE EXCEEDED

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
 A '.' INDICATES THAT NO SAMPLE WAS TAKEN

DRINKING WATER SURVEILLANCE PROGRAM

NORTH BAY WATER SUPPLY 1987 ANNUAL REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to eventually include all municipal supplies in Ontario. Currently, 44 plants are being monitored. Appendix A contains a detailed description of the DWSP.

The DWSP was initiated on the North Bay Water Supply in March of 1987.

PLANT DESCRIPTION

The North Bay Water Treatment Plant is a pumping station that disinfects and fluoridates water from Trout Lake before distribution. This plant serves a population of approximately 50,000. It has a design capacity of 24 x 1000m³/day and daily flows ranging from 20 x 1000m³/day to 41 x 1000m³/day.

The plant location is shown in Figure 1. General plant information is presented in Table 2.

METHODS

Raw and treated water at the treatment plant were not sampled in 1987 because the sample lines do not meet DWSP requirements.

Samples were obtained from two DWSP approved locations;

- i) Distribution System - Site 1 - This house is approximately 1.2 kilometers from the plant. Water was sampled through a copper sample line at the basement laundry tap.
- ii) Distribution System - Site 2 - This house is approximately 2.0 kilometers from the plant. Water was sampled through a copper sample line at the kitchen sink tap.

At the distribution system location two types of samples were obtained: a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service connection for a minimum of six hours. These samples are used to make an assessment of the amount by which the levels of inorganic compounds and metals may be changed on standing due to leaching from (or deposition on) the plumbing system. The only analyses carried out on these samples therefore, are General Chemistry and Metals. The free flow sample represented fresh water from the distribution main that had been flowing for five minutes before the sample was taken.

Stringent DWSP sampling protocols were followed to eliminate any variance (Appendix B).

FIGURE 1

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

SITE LOCATION MAP

LOCATION: NORTH BAY WATER TREATMENT PLANT

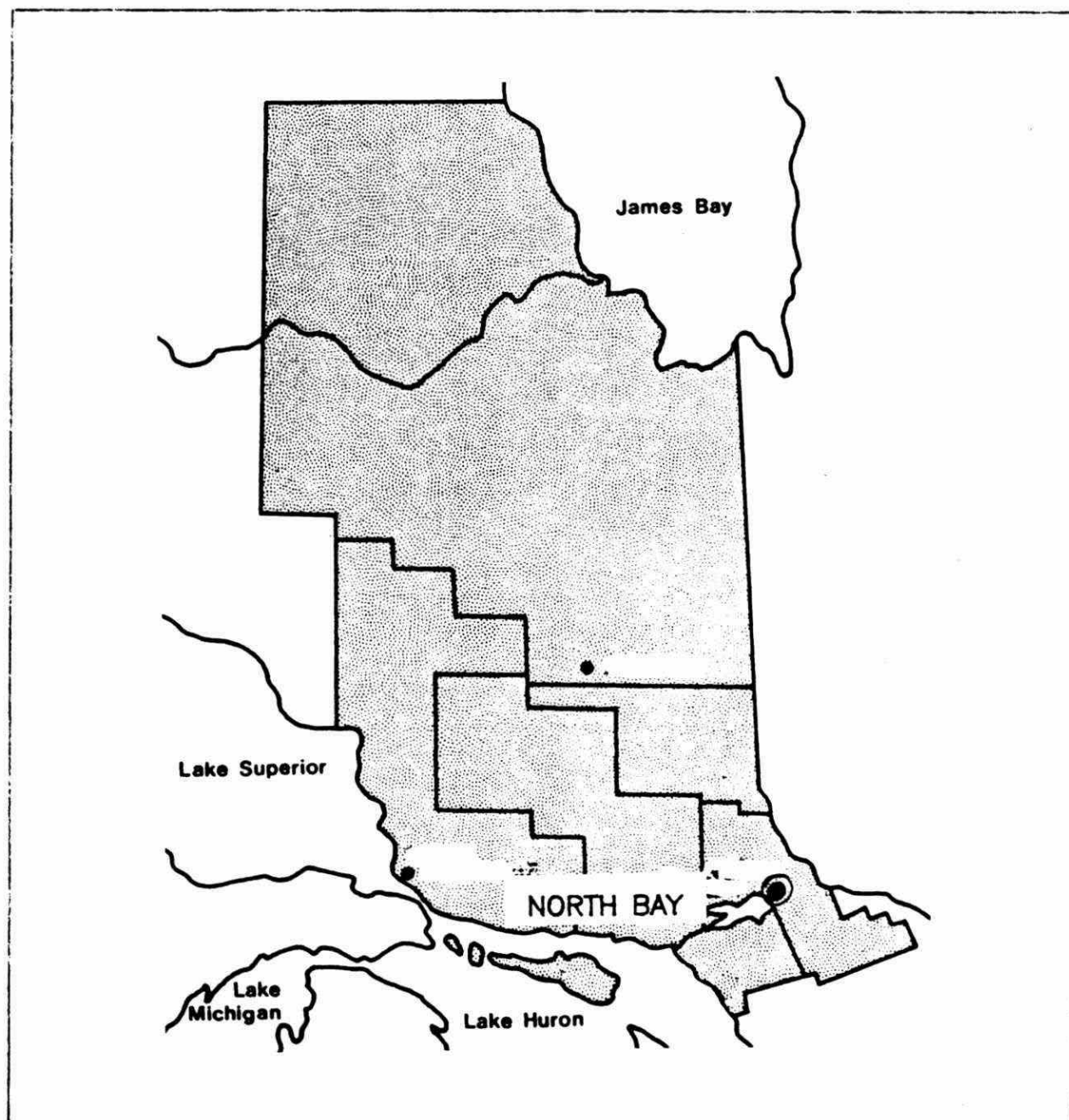


TABLE 2

DRINKING WATER SURVEILLANCE PROGRAM ANNUAL REPORT

GENERAL INFORMATION

NORTH BAY WATER SUPPLY SYSTEM

<u>LOCATION:</u>	248 LAKESIDE DRIVE NORTH BAY, ONTARIO P1B 3E3 (705-474-3417)
<u>SOURCE:</u>	RAW WATER SOURCE - TROUT LAKE
<u>RATED CAPACITY:</u>	22.5 (1000 M3/DAY)
<u>OPERATION:</u>	MUNICIPALITY
<u>PLANT SUPERINTENDENT:</u>	B. WINTON
<u>MINISTRY REGION:</u>	NORTHEAST
<u>DISTRICT OFFICER:</u>	J.R. HARMAR

<u>MUNICIPALITY SERVED</u>	<u>POPULATION</u>
NORTH BAY	50,000

Sample day flow, treatment chemical dosages and Field Chemistry measurements such as Turbidity, Chlorine Residuals, pH and Temperature were recorded on the day of sampling and were entered on the DWSP data base as submitted.

RESULTS

The North Bay Water Supply distribution system was sampled for approximately 160 parameters on a monthly basis beginning in March. The water at the plant was not sampled.

The Phenolics, Polynuclear Aromatic Hydrocarbons and Chlorophenols scans were not analyzed for.

Table 3 contains information on the sample day retention time, flow rate and treatment chemicals used and their associated dosages.

Table 4 is a summary break-down of the number of water samples analysed for by parameter and by water type. The number of times that a positive or trace result was detected is also reported.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment (MOE) laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit

that it cannot be confidently quantified.

Table 5 presents the results for parameters detected on at least one occasion.

Table 6 presents parameters not detected.

Associated guidelines and detection limits are also supplied on both tables. Parameters are listed alphabetically within each scan.

DISCUSSION

General

Water quality is judged by comparison with the Ontario Drinking Water Objectives (ODWOs) as defined in the 1984 publication (ISBN 0-7743-8985-0). The Province of Ontario has health related and aesthetic objectives for 49 parameters, these are currently under review. When an ODWO is not available guidelines/limits from other agencies are consulted. The Parameters Listing System (PALIS) recently initiated by the MOE catalogues and keeps current over 1750 guidelines for 650 parameters from agencies throughout the world.

As stated under Results, traces do not indicate quantifiable values, as defined by established MOE Laboratory analytical reporting protocols. While they can be useful in trend analysis or confirmation of the presence of a specific contaminant that

is repeatedly detected at these levels, the occasional finding of a trace level of a contaminant is not considered to be significant. DISCUSSION OF GUIDELINES AND LIMITS THEREFORE, IS ONLY CONDUCTED ON POSITIVE RESULTS.

Bacteriology

Positive results for the Bacteriology scan were present eight times in the distribution system Site 1 water and fifteen times in the Site 2 water. The positive parameters were Standard Plate Count, Total Coliform and/or Total coliform Background and Presence/absence test.

Coliforms were present in the Presence/Absence test for the August distribution system Site 2 water. Aeromonas Sp was present in the Presence/Absence test for the November Site 2 water.

Standard Plate Count is a test used to supplement routine analysis for Coliform bacteria. The limit for Standard Plate Count (at 35°C after 48 hours) in the ODWOs is 500 organisms/mL based on a geometric mean of 5 or more samples. High Standard Plate Counts were present in the distribution system Site 1 water June sampling, Total Coliform Background counts were high in samples from both sites.

Due to its sampling frequency of once per month, the DWSP is not designed to evaluate all aspects of the bacteriological quality

of water. Routine bacteriological monitoring as outlined in the ODWOs is carried out by the operating authority. Water from the North Bay Water Supply, in terms of the limited DWSP bacteriological examination, was of good quality.

Inorganic and Physical Parameters

Laboratory and Field Chemistry

The results for Laboratory Chemistry and Field Chemistry scans were below applicable health related ODWOs.

There are ODWOs that are set for parameters which are related to aesthetic quality rather than health; one of these is Organic Nitrogen. Organic Nitrogen values are calculated by subtracting the value for Ammonia (Ammonium Total) from the value for Total Kjeldahl Nitrogen (Nitrogen Tot Kjeld). The aesthetic ODWO of 0.15 mg/L was exceeded in many of the samples. When Organic Nitrogen exceeds 0.15 mg/l in treated water some taste and odour problems can result.

This guideline is exceeded in most supplies. Based on the information obtained from the DWSP, which generally indicates no problems with this parameter exceedence, the guideline may be modified when the ODWOs are reviewed.

Colour values exceeded the aesthetic ODWO of 5 True Colour Units (TCU) in fourteen of the distribution system Site 1 standing and free flow samples and twelve Site 2 waters. Colour in drinking

water may be due to the presence of natural or synthetic organic substances as well as certain metallic ions.

It is desirable that the Temperature of drinking water be less than 15°C; the palatability of water is enhanced by its coolness. A temperature below 15°C will tend to reduce the growth of nuisance organisms and hence minimize associated taste, colour, odour and corrosion problems. The desired ODWO was exceeded five times in the free flow distribution waters.

As part of the treatment plant process Fluosilic acid is added to the treated water (Table 3). Where fluoridation is practised, the Fluoride concentration recommended in the ODWO is 1.2 mg/L, plus or minus 0.2 mg/L. Maintenance of this level can be observed in the Fluoride values for all the samples.

Metals

Elevated levels of Cadmium, Copper, Nickel, Lead and Zinc were detected in the standing samples as compared to the free flow distribution samples, indicating that small quantities of these metals were leached from the household plumbing as the water stood overnight.

The Lead levels in the June and August standing samples from Site 1 are high; the Nickel value is also elevated in the August sample. Samples from this location always show higher levels for these metals in the standing samples than those from Site 2 (indicating the possibility of a lead service connection and a

higher tendency for metal leaching). Review of the quantifiable metal levels in the August sample indicates a potential laboratory dilution error.

Organic

Chloroaromatics

The results of the Chloroaromatics group showed that three parameters were detected:

Hexachloroethane

1,3,5-Trichlorobenzene

2,3,6-Trichlorotoluene

Hexachloroethane was detected at trace levels, twice in the distribution system Site 1 water and twice in the Site 2 water.

1,3,5-Trichlorobenzene was detected at a trace level, once in the distribution system Site 1 water.

2,3,6-Trichlorotoluene was detected at a trace level, once in the distribution system Site 1 water.

Review of these results, along with information from other water supplies on DWSP, would indicate that certain Chloroaromatics appear more frequently in the treated water than in the raw and almost always only at trace levels. These occurrences could possibly be due to a reaction of chlorine with organics present in the water or in the distribution system.

Pesticides and PCB (Polychlorinated Biphenyl)

Within the Pesticides and PCB scan two pesticides were detected:

Alpha BHC

Lindane

Lindane consists of several isomers of BHC (Benzene Hexachloride). Alpha BHC is the isomer most predominantly found in the Great Lakes basin as indicated in results from other water supplies on DWSP.

Alpha BHC was detected at trace levels, seven times in the distribution system Site 1 water, and eight times in the Site 2 water.

Lindane was detected at trace levels, twice in the distribution system Site 1 water and once in the Site 2 water.

Specific Pesticides

Within the Specific Pesticides scan no pesticides were detected.

Volatiles

Within the Volatile scan eight parameters, other than Trihalomethanes (THMs), were detected:

Benzene

Toluene

Ethylbenzene

Para and Meta-Xylene

Ortho-Xylene
1,4-Dichlorobenzene
1,3-Dichlorobenzene
1,2-Dichlorobenzene

Benzene was detected at trace levels, twice in the distribution system Site 1 water and once in the Site 2 water.

Toluene was detected, once in both distribution system waters, the positive values were considered to be unreliable due to contamination as per the remark 'UCS'.

Ethylbenzene was detected at trace levels, once in the distribution system Site 1 water and three times in the Site 2 water.

Para and Meta-Xylene are measured as one compound, M-Xylene and were detected at trace levels, once in both distribution system waters.

Ortho-Xylene (O-Xylene) was detected at a trace level, once in the distribution system Site 1 water.

These volatiles are typically found on an occasional basis at other water supplies included on the DWSP, usually at trace levels.

1,4-Dichlorobenzene, 1,3-Dichlorobenzene and 1,2-Dichlorobenzene were reported with positive values for Site 2 October water sample. These values were considered to be unreliable due to contamination as per the remark 'UCS'.

THMs are acknowledged to be produced during the water treatment process and will always occur in chlorinated surface waters. THMs are comprised mainly of Chloroform, Chlorodibromomethane and Dichlorobromomethane with Bromoform occurring occasionally. Results are reported for the individual compounds as well as for total THMs.

Chloroform, Dichlorobromomethane and Total THMs were always detected in the distributed water. Chlorodibromomethane was detected at trace levels, once in the Site 1 water and twice in the Site 2 water. It was found positive once at both Sites. Bromoform was not detected. All THM occurrences were well below the ODWO of 350 ug/L for Total THMs.

CONCLUSIONS

The North Bay Water Supply for the sample year of 1987 produced good quality water throughout the distribution system.

No health related guidelines for organic or inorganic parameters, were exceeded during 1987.

RECOMMENDATIONS

Two recommendations can be made:

1) The data base should be reviewed in consultation with Regional, Plant and DWSP personnel to determine if sampling location, sampling frequency and the number of parameters analysed could be altered to allow for a more efficient characterization of the water.

2) The plant should retrofit their sample lines to meet the DWSP requirements so that raw and treated water can be sampled and a comprehensive examination of the water supply can be carried out.

TABLE 3

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SAMPLE DAY CONDITIONS			TREATMENT CHEMICAL DOSAGES (MG/L)		
DATE	RETENTION TIME(HRS)	FLOW (1000 M3)	PRE-CHLORINATION	FLUORIDATION	ALKALINITY ADJUST
			CHLORINE	FLUOSILIC ACID	SODIUM CARBONATE
MAR 31	.1	29.0	02.02	01.26	07.55
APR 28	.1	26.3	02.15	01.20	09.11
MAY 26	.1	20.2	02.02	01.20	10.09
JUN 23	.1	41.1	01.95	01.26	11.10
JUL 28	.1	38.0	02.02	01.26	11.60
AUG 25	.1	24.7	02.40	01.20	13.60
SEP 29	.1	35.5	01.95	01.14	13.10
OCT 27	.1	25.4	02.15	01.14	09.11
NOV 24	.2	27.9	02.02	01.26	05.80
DEC 15	.1	28.3	01.89	01.26	07.30

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW WATER			TREATED WATER			SITE 1			SITE 2		
		# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE
BACTERIOLOGICAL	AEROMONAS SP	0	0	0	0	0	0	0	0	0	2	1	0
	COLIFORM	0	0	0	0	0	0	0	0	0	2	1	0
	ESCHERICHIA COLI BY PRESENCE/ABSENCE	0	0	0	0	0	0	0	0	0	2	0	0
	FECAL COLIFORM	0	0	0	0	0	0	0	0	0	2	0	0
	P/A BOTTLE	0	0	0	0	0	0	8	0	0	8	2	0
	STANDARD PLATE COUNT MEMBRANE FILT.	0	0	0	0	0	0	4	4	0	6	6	0
	STAPH AUREUS	0	0	0	0	0	0	0	0	0	2	0	0
	TOTAL COLIFORM BACKGROUND MF	0	0	0	0	0	0	9	4	0	7	5	0
	TOTAL COLIFORM MEMBRANE FILTRATION	0	0	0	0	0	0	9	0	0	7	0	0
*TOTAL SCAN BACTERIOLOGICAL		0	0	0	0	0	0	30	8	0	38	15	0
*TOTAL GROUP BACTERIOLOGICAL		0	0	0	0	0	0	30	8	0	38	15	0
CHEMISTRY (FLD)	FIELD COMBINED CHLORINE RESIDUAL	0	0	0	0	0	0	16	16	0	16	16	0
	FIELD FREE CHLORINE RESIDUAL	0	0	0	0	0	0	16	16	0	18	18	0
	FIELD PH	0	0	0	0	0	0	16	16	0	17	17	0
	FIELD TEMPERATURE	0	0	0	0	0	0	16	16	0	18	18	0
	FIELD TOTAL CHLORINE RESIDUAL	0	0	0	0	0	0	16	16	0	18	18	0
	FIELD TURBIDITY	0	0	0	0	0	0	9	9	0	2	2	0
	*TOTAL SCAN CHEMISTRY (FLD)	0	0	0	0	0	0	89	89	0	89	89	0
CHEMISTRY (LAB)	ALKALINITY	0	0	0	0	0	0	17	17	0	18	18	0
	AMMONIUM TOTAL	0	0	0	0	0	0	18	10	8	16	9	6
	CALCIUM	0	0	0	0	0	0	17	17	0	18	18	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW WATER			TREATED WATER			SITE 1			SITE 2		
		# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE
CHEMISTRY (LAB)	CHLORIDE	0	0	0	0	0	0	18	18	0	18	18	0
	COLOUR	0	0	0	0	0	0	18	18	0	16	16	0
	CONDUCTIVITY	0	0	0	0	0	0	18	18	0	18	18	0
	CYANIDE	0	0	0	0	0	0	8	0	0	9	0	0
	FLUORIDE	0	0	0	0	0	0	18	18	0	18	18	0
	HARDNESS	0	0	0	0	0	0	17	17	0	18	18	0
	MAGNESIUM	0	0	0	0	0	0	18	18	0	18	18	0
	NITRITE	0	0	0	0	0	0	18	5	11	16	2	13
	NITROGEN TOTAL KJELDAHL	0	0	0	0	0	0	18	18	0	18	17	1
	PH	0	0	0	0	0	0	18	18	0	18	18	0
	SODIUM	0	0	0	0	0	0	18	18	0	18	18	0
	TOTAL NITRATES	0	0	0	0	0	0	18	18	0	16	16	0
	TOTAL SOLIDS	0	0	0	0	0	0	16	16	0	18	18	0
	TURBIDITY	0	0	0	0	0	0	18	18	0	18	18	0
*TOTAL SCAN CHEMISTRY (LAB)		0	0	0	0	0	0	291	262	19	289	258	20
METALS	ALUMINUM	0	0	0	0	0	0	16	16	0	18	17	0
	ARSENIC	0	0	0	0	0	0	18	1	0	18	0	0
	BARIUM	0	0	0	0	0	0	16	16	0	18	18	0
	BERYLLIUM	0	0	0	0	0	0	16	1	0	18	0	0
	BORON	0	0	0	0	0	0	16	0	6	18	0	6
	CADMIUM	0	0	0	0	0	0	16	4	0	18	0	0
	CHROMIUM	0	0	0	0	0	0	16	2	0	18	0	0
	COBALT	0	0	0	0	0	0	16	3	0	18	1	0
	COPPER	0	0	0	0	0	0	16	16	0	18	18	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW WATER			TREATED WATER			SITE 1			SITE 2		
		# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE
METALS	IRON	0	0	0	0	0	0	16	16	0	18	18	0
	LEAD	0	0	0	0	0	0	16	13	0	18	7	0
	MANGANESE	0	0	0	0	0	0	16	16	0	18	18	0
	MERCURY	0	0	0	0	0	0	9	4	0	9	6	0
	MOLYBDENUM	0	0	0	0	0	0	16	1	0	18	0	0
	NICKEL	0	0	0	0	0	0	16	11	0	18	9	0
	SELENIUM	0	0	0	0	0	0	18	2	0	18	0	0
	STRONTIUM	0	0	0	0	0	0	16	16	0	18	18	0
	URANIUM	0	0	0	0	0	0	16	6	0	18	7	0
	VANADIUM	0	0	0	0	0	0	16	1	0	18	0	0
	ZINC	0	0	0	0	0	0	16	16	0	18	18	0
*TOTAL SCAN METALS		0	0	0	0	0	0	317	161	6	351	155	6
*TOTAL GROUP INORGANIC & PHYSICAL		0	0	0	0	0	0	697	512	25	729	502	26
CHLOROAROMATICS	123 TRICHLOROBENZENE	0	0	0	0	0	0	8	0	0	8	0	0
	1234 TETRACHLOROBENZENE	0	0	0	0	0	0	8	0	0	8	0	0
	1235 TETRACHLOROBENZENE	0	0	0	0	0	0	8	0	0	8	0	0
	124 TRICHLOROBENZENE	0	0	0	0	0	0	8	0	0	8	0	0
	1245 TETRACHLOROBENZENE	0	0	0	0	0	0	8	0	0	8	0	0
	135 TRICHLOROBENZENE	0	0	0	0	0	0	8	0	1	8	0	0
	236 TRICHLOROTOLUENE	0	0	0	0	0	0	8	0	1	8	0	0
	245 TRICHLOROTOLUENE	0	0	0	0	0	0	8	0	0	8	0	0
	26A TRICHLOROTOLUENE	0	0	0	0	0	0	8	0	0	8	0	0
	HEXACHLOROBUTADIENE	0	0	0	0	0	0	8	0	0	8	0	0
	HEXACHLOROETHANE	0	0	0	0	0	0	8	0	2	8	0	2

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW WATER			TREATED WATER			SITE 1			SITE 2		
		# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE
CHLOROAROMATICS	OCTACHLOROSTYRENE	0	0	0	0	0	0	8	0	0	8	0	0
	PENTACHLOROBENZENE	0	0	0	0	0	0	8	0	0	8	0	0
*TOTAL SCAN CHLOROAROMATICS		0	0	0	0	0	0	104	0	4	104	0	2
PESTICIDES & PCB	ALACHLOR	0	0	0	0	0	0	9	0	0	9	0	0
	ALDRIN	0	0	0	0	0	0	8	0	0	8	0	0
	ALPHA BHC	0	0	0	0	0	0	8	0	7	8	0	8
	ALPHA CHLORDANE	0	0	0	0	0	0	8	0	0	8	0	0
	ATRATONE	0	0	0	0	0	0	9	0	0	9	0	0
	BETA BHC	0	0	0	0	0	0	8	0	0	8	0	0
	DIELDRIN	0	0	0	0	0	0	8	0	0	8	0	0
	ENDRIN	0	0	0	0	0	0	8	0	0	8	0	0
	ETHYLENE DIBROMIDE	0	0	0	0	0	0	9	0	0	9	0	0
	GAMMA CHLORDANE	0	0	0	0	0	0	8	0	0	8	0	0
	HEPTACHLOR	0	0	0	0	0	0	8	0	0	8	0	0
	HEPTACHLOR EPOXIDE	0	0	0	0	0	0	8	0	0	8	0	0
	HEXACHLOROBENZENE	0	0	0	0	0	0	8	0	0	8	0	0
	LINDANE	0	0	0	0	0	0	8	0	2	8	0	1
	METHOXYCHLOR	0	0	0	0	0	0	8	0	0	8	0	0
	MIREX	0	0	0	0	0	0	8	0	0	8	0	0
	O,P-DDT	0	0	0	0	0	0	8	0	0	8	0	0
	OXYCHLORDANE	0	0	0	0	0	0	8	0	0	8	0	0
	PCB	0	0	0	0	0	0	8	0	0	8	0	0
	PP-DDD	0	0	0	0	0	0	8	0	0	8	0	0
	PPDDE	0	0	0	0	0	0	8	0	0	8	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW WATER			TREATED WATER			SITE 1			SITE 2		
		# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE
PESTICIDES & PCB	PPDDT	0	0	0	0	0	0	8	0	0	8	0	0
	THIODAN I	0	0	0	0	0	0	8	0	0	8	0	0
	THIODAN II	0	0	0	0	0	0	8	0	0	8	0	0
	THIODAN SULPHATE	0	0	0	0	0	0	8	0	0	8	0	0
*TOTAL SCAN PESTICIDES & PCB		0	0	0	0	0	0	203	0	9	203	0	9
SPECIFIC PESTICIDES	AMETRYNE	0	0	0	0	0	0	9	0	0	9	0	0
	ATRAZINE	0	0	0	0	0	0	9	0	0	9	0	0
	BLADEX	0	0	0	0	0	0	9	0	0	9	0	0
	METOLACHLOR	0	0	0	0	0	0	9	0	0	9	0	0
	PROMETONE	0	0	0	0	0	0	9	0	0	9	0	0
	PROMETRYNE	0	0	0	0	0	0	9	0	0	9	0	0
	PROPAZINE	0	0	0	0	0	0	9	0	0	9	0	0
	SENCOR	0	0	0	0	0	0	9	0	0	9	0	0
	SIMAZINE	0	0	0	0	0	0	9	0	0	9	0	0
	TOXAPHENE	0	0	0	0	0	0	0	0	0	0	0	0
*TOTAL SCAN SPECIFIC PESTICIDES		0	0	0	0	0	0	81	0	0	81	0	0
VOLATILES	1,1 DICHLOROETHANE	0	0	0	0	0	0	9	0	0	9	0	0
	1,1 DICHLOROETHYLENE	0	0	0	0	0	0	9	0	0	9	0	0
	1,2 DICHLOROBENZENE	0	0	0	0	0	0	9	0	0	9	1	0
	1,2 DICHLOROETHANE	0	0	0	0	0	0	9	0	0	9	0	0
	1,2 DICHLOROPROPANE	0	0	0	0	0	0	9	0	0	9	0	0

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P.

SUMMARY TABLE OF RESULTS (1987)

SCAN	PARAMETER	RAW WATER			TREATED WATER			SITE 1			SITE 2		
		# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE	# ANALYSED	POSITIVE	TRACE
VOLATILES	1,3 DICHLOROBENZENE	0	0	0	0	0	0	9	0	0	9	1	0
	1,4 DICHLOROBENZENE	0	0	0	0	0	0	9	0	0	9	1	0
	111, TRICHLOROETHANE	0	0	0	0	0	0	9	0	0	9	0	0
	112 TRICHLOROETHANE	0	0	0	0	0	0	9	0	0	9	0	0
	1122 TETRA-CHLOROETHANE	0	0	0	0	0	0	9	0	0	9	0	0
	BENZENE	0	0	0	0	0	0	9	0	2	9	0	1
	BROMOFORM	0	0	0	0	0	0	9	0	0	9	0	0
	CARBON TETRACHLORIDE	0	0	0	0	0	0	9	0	0	9	0	0
	CHLOROBENZENE	0	0	0	0	0	0	9	0	0	9	0	0
	CHLORODIBROMOMETHANE	0	0	0	0	0	0	9	1	1	9	1	2
	CHLOROFORM	0	0	0	0	0	0	9	9	0	9	9	0
	DICHLOROBROMOMETHANE	0	0	0	0	0	0	9	9	0	9	9	0
	ETHYLBENZENE	0	0	0	0	0	0	9	0	1	9	0	3
	M-XYLENE	0	0	0	0	0	0	9	0	1	9	0	1
	METHYLENE CHLORIDE	0	0	0	0	0	0	9	0	0	9	0	0
	O-XYLENE	0	0	0	0	0	0	9	0	1	9	0	0
	P-XYLENE	0	0	0	0	0	0	9	0	0	9	0	0
	TETRACHLOROETHYLENE	0	0	0	0	0	0	9	0	0	9	0	0
	TOLUENE	0	0	0	0	0	0	9	1	0	9	1	0
	TOTAL TRIHALOMETHANES	0	0	0	0	0	0	9	9	0	9	9	0
	TRANS 1,2 DICHLOROETHYLENE	0	0	0	0	0	0	9	0	0	9	0	0
	TRICHLOROETHYLENE	0	0	0	0	0	0	9	0	0	9	0	0
	TRIFLUOROCHLOROTOLUENE	0	0	0	0	0	0	9	0	0	9	0	0
*TOTAL SCAN VOLATILES		0	0	0	0	0	0	252	29	6	252	32	7
*TOTAL GROUP ORGANIC		0	0	0	0	0	0	640	29	19	640	32	18
TOTAL		0	0	0	0	0	0	1367	549	44	1407	549	44

KEY TO TABLES 5 AND 6

- A ONTARIO DRINKING WATER OBJECTIVES
1. Maximum Acceptable Concentration (MAC)
 - 1+. MAC for Total Trihalomethanes
 - 1*. MAC for Bacteriological Analyses
- Poor water quality is indicated when :
- total coliform counts > 0 < 5
 - P/A Bottle Test is present after 48 hours
 - Aeromonas organisms are detected in more than 25% of samples in a single submission or in successive submissions from the same sampling site
 - Pseudomonas Aeruginosa, Staphylococcus Aureus and members of the Fecal Streptococcus group should not be detected in any sample
 - Standard Plate Count should not exceed 500 organisms per ml at 35 deg C within 48 hours
2. Interim Maximum Acceptable Concentration (IMAC)
 3. Maximum Desirable Concentration (MDC)
 4. Aesthetic or Recommended Operational Guideline
- hardness levels between 80 and 100 mg/L as calcium carbonate are considered to provide an acceptable balance between corrosion and incrustation, water supplies with a hardness >200 mg/L are considered poor and those in excess of 500 mg/L are unacceptable.
- B HEALTH & WELFARE CANADA
1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
- C WORLD HEALTH ORGANIZATION
1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- H USSR MAXIMUM PERMISSIBLE CONCENTRATION
- I NEW YORK STATE AMBIENT WATER GUIDELINE

LABORATORY RESULTS, REMARK DESCRIPTIONS

.	No Sample Taken
BDL	Below Minimum Measurable Amount
<T	Greater Than Detection Limit But Not Confident
>	Results Are Greater Than The Upper Limit
<=>	Approximate Result
!AW	No Data: Analysis Withdrawn
!CR	No Data: Could Not Confirm By Reanalysis
!CS	No Data: Contamination Suspected
!IL	No Data: Sample Incorrectly Labelled
!IS	No Data: Insufficient Sample
!LA	No Data: Laboratory Accident
!LD	No Data: Test Queued After Sample Discarded
!NA	No Data: No Authorization To Perform Reanalysis
!NP	No Data: No Procedure
!NR	No Data: Sample Not Received
!OP	No Data: Obscured Plate
!PE	No Data: Procedural Error - Sample Discarded
!PH	No Data: Sample pH Outside Valid Range
!RO	No Data: See Attached Report (no numeric results)
!SM	No Data: Sample Missing
!SS	No Data: Send Separate Sample Properly Preserved
!UI	No Data: Indeterminant Interference
A3C	Approximate, Total Count Exceeded 300 Colonies
APL	Additional Peak, Large, Not Priority Pollutant
APS	Additional Peak, Less Than, Not Priority Pollutant
CIC	Possible Contamination, Improper Cap
CRO	Calculated Result Only
PPS	Test Performed On Preserved Sample

RMP	P and M-Xylene Not Separated
RRV	Rerun Verification
RVU	Reported Value Unusual
SPS	Several Peaks, Small, Not Priority Pollutant
UAL	Unreliable: Sample Age Exceeds Normal Limit
UCR	Unreliable: Could Not Confirm By Reanalysis
UCS	Unreliable: Contamination Suspected
UIN	Unreliable: Indeterminant Interference
XP	Positive After X Number of Hours

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING	FREE FLOW	STANDING	FREE FLOW		

BACTERIOLOGICAL					
AEROMONAS SP (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE = 0	(A1)
AUG	.	.	.	0	
NOV	.	.	.	1	

E. COLI (P/A) (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE =	
AUG	.	.	.	0	
NOV	.	.	.	0	

FECAL COLIFORM (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE = 0	(A1)
AUG	.	.	.	0	
NOV	.	.	.	0	

STANDRD PLATE CNT MF (CT/ML)		DET'N LIMIT = 0		GUIDELINE = 500/ML	(A1)
MAR	.	28	.	15	
APR	.	!AW	.	110	
MAY	.	!AW	.	!AW	
JUN	.	1500	.	160	
JUL	.	.	.	270	
AUG	.	!AW	.	25	
SEP	.	185	.	.	
OCT	.	32	.	.	
NOV	.	!AW	.	!LA	
DEC	.	!AW	.	7	

P/A BOTTLE (0=ABSENT)		DET'N LIMIT = 0		GUIDELINE = 0	(A1*)
MAR	.	0	.	0	
APR	.	0	.	0	
MAY	.	0	.	0	
JUN	.	0	.	0	
JUL	.	.	.	0	
AUG	.	0	.	1	
SEP	.	0	.	.	
OCT	.	0	.	.	
NOV	.	!LA	.	1	
DEC	.	0	.	0	

STAPH AUREUS (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE = 0	(A1)
AUG	.	.	.	0	
NOV	.	.	.	0	

COLIFORM (0=ABSENT)		DET'N LIMIT = N/A		GUIDELINE = 0	(A1)

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT		DISTRIBUTION SYSTEM		
SITE 1		SITE 2		
STANDING	FREE FLOW	STANDING	FREE FLOW	
<hr/>				
AUG	.	.	.	1
NOV	.	.	.	0
<hr/>				
TOTAL COLIFORM MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = 5/100ML(A1)
MAR	.	0	.	0
APR	.	0	.	0
MAY	.	0	.	0
JUN	.	0	.	0
JUL	.	.	.	0
AUG	.	0	.	0
SEP	.	0	.	.
OCT	.	0	.	.
NOV	.	0	.	!LA
DEC	.	0	.	0
<hr/>				
T COLIFORM BCKGRD MF (CT/100ML)		DET'N LIMIT = 0		GUIDELINE = N/A
MAR	.	0	.	0
APR	.	0	.	1
MAY	.	160	.	920
JUN	.	2400 >	.	2400 >
JUL	.	.	.	360
AUG	.	13	.	740
SEP	.	0	.	.
OCT	.	0	.	.
NOV	.	6	.	!LA
DEC	.	0	.	0

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

SITE 1

SITE 2

STANDING

FREE FLOW

STANDING

FREE FLOW

CHEMISTRY (FLD)

FLD CHLORINE (COMB) (MG/L)			DET'N LIMIT = N/A	GUIDELINE =	N/A
MAR	.250	.250	.	.200	
APR	.	.	.200	.	
	.300	.300	.200	.200	
MAY	.200	.200	.100	.100	
JUN	.050	.080	.100	.130	
AUG	.300	.350	.100	.100	
SEP	.300	.250	.	.	
OCT	.250	.300	.100	.100	
NOV	.350	.350	.100	.100	
DEC	.	.	.200	.200	

FLD CHLORINE FREE (MG/L)			DET'N LIMIT = N/A	GUIDELINE =	N/A
MAR	.100	.150	.	.150	
APR	.	.	.100	.	
	.200	.200	.100	.100	
MAY	.100	.100	.100	.100	
JUN	.100	.300	.100	.140	
JUL	.	.	.040	.050	
AUG	.100	.150	.300	.300	
SEP	.100	.150	.	.	
OCT	.100	.200	.100	.100	
NOV	.200	.250	.100	.100	
DEC	.	.	.100	.100	

TOTAL CHLORINE (MG/L)			DET'N LIMIT = N/A	GUIDELINE =	N/A
MAR	.350	.400	.	.350	
APR	.	.	.300	.	
	.500	.500	.300	.300	
MAY	.300	.300	.100	.100	
JUN	.150	.380	.100	.200	
JUL	.	.	.090	.100	
AUG	.400	.500	.400	.400	
SEP	.400	.400	.	.	
OCT	.350	.500	.100	.100	
NOV	.550	.600	.100	.150	
DEC	.	.	.300	.300	

FLD PH (DMSNLESS)			DET'N LIMIT = N/A	GUIDELINE = 6.5-8.5 (A4)	
MAR	7.400	7.400	.	7.000	
APR	.	.	7.000	.	
	7.400	7.400	7.100	7.100	
MAY	7.400	7.400	7.200	7.200	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
	STANDING	FREE FLOW	STANDING	FREE FLOW	
JUN	7.400	7.400	7.200	7.200	
JUL	.	.	.	7.910	
AUG	7.000	7.200	7.200	7.000	
SEP	7.400	7.400	.	.	
OCT	7.200	7.200	7.200	7.000	
NOV	7.200	7.200	7.000	7.200	
DEC	.	.	7.200	7.200	

TEMPERATURE (DEG.C)	DET'N LIMIT = N/A		GUIDELINE =		N/A
MAR	6.000	5.500	.	4.000	
APR	.	.	13.000	.	
	11.000	9.000	14.000	7.000	
MAY	14.000	9.000	14.500	10.000	
JUN	15.000	10.000	19.000	12.000	
JUL	.	.	14.000	17.000	
AUG	18.000	15.000	18.000	15.000	
SEP	15.000	13.000	.	.	
OCT	14.000	12.000	17.100	11.000	
NOV	11.000	9.000	15.000	8.000	
DEC	.	.	11.000	5.000	

FLD TURBIDITY (FTU)	DET'N LIMIT = N/A		GUIDELINE = 1.0		(A1)
APR	.	.670	.	.	
AUG	.650	.650	.300	.300	
SEP	.600	.600	.	.	
OCT	.650	.650	.	.	
NOV	.550	.550	.	.	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING		FREE FLOW	STANDING	FREE FLOW	

CHEMISTRY (LAB)					
ALKALINITY (MG/L)		DET'N LIMIT = .200		GUIDELINE = 30-500 (A4)	
MAR	22.600	22.400	.	21.200	
APR	.	.	23.100	.	
	22.800	21.500	21.900	21.600	
MAY	24.100	21.900	23.000	23.700	
JUN	ICR	22.600	23.000	22.100	
JUL	.	.	22.900	22.300	
AUG	23.300	23.100	23.300	21.900	
SEP	26.400	25.500	.	.	
OCT	21.900	20.900	22.900	21.700	
NOV	17.400	16.900	18.200	17.400	
DEC	18.700	17.900	17.400	17.500	

CALCIUM (MG/L)		DET'N LIMIT = .100		GUIDELINE = 100. (F2)	
MAR	6.500	6.400	.	6.300	
APR	.	.	6.700	.	
	6.800	6.400	6.800	6.600	
MAY	ICR	6.200	6.400	6.200	
JUN	6.000	5.800	6.000	5.600	
JUL	.	.	6.000	5.400	
AUG	6.600	6.400	7.600	7.600	
SEP	8.600	8.600	.	.	
OCT	7.800	7.400	7.600	7.200	
NOV	7.200	7.000	6.600	6.600	
DEC	5.600	5.200	5.600	5.200	

CHLORIDE (MG/L)		DET'N LIMIT = .200		GUIDELINE = 250.0 (A3)	
MAR	17.500	17.500	.	17.000	
APR	.	.	18.500	.	
	14.000	14.000	14.500	14.000	
MAY	13.500	13.000	13.000	13.000	
JUN	13.500	13.000	13.500	13.000	
JUL	.	.	13.000	13.000	
AUG	13.000	13.000	13.000	13.000	
SEP	13.000	12.500	.	.	
OCT	13.300	13.100	13.500	13.000	
NOV	13.800	13.700	14.100	13.600	
DEC	14.200	14.000	13.700	13.900	

COLOUR (TCU)		DET'N LIMIT = .5		GUIDELINE = 5.0 (A3)	
MAR	7.000	7.000	.	7.000	
APR	.	.	8.000	.	
	7.500	7.000	8.000	8.000	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT		DISTRIBUTION SYSTEM		
SITE 1		SITE 2		
STANDING	FREE FLOW	STANDING	FREE FLOW	
MAY	3.500	5.000	5.000	5.000
JUN	4.000	6.000	6.500	6.500
JUL	.	.	7.500	7.000
AUG	6.500	6.000	5.500	6.000
SEP	6.000	5.500	.	.
OCT	5.500	5.000	6.500	5.500
NOV	7.000	6.500	6.000	5.000
DEC	7.590	6.500	ISM	ISM
<hr/>				
CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1		GUIDELINE = 400. (F2)
MAR	139	136	.	135
APR	.	.	144	.
	121	118	122	119
MAY	125	119	115	122
JUN	121	117	119	116
JUL	.	.	119	118
AUG	117	116	119	117
SEP	126	122	.	.
OCT	116	113	119	115
NOV	109	107	112	109
DEC	117	115	114	113
<hr/>				
FLUORIDE (MG/L)		DET'N LIMIT = .01		GUIDELINE = 2.400 (A1)
MAR	1.180	1.150	.	1.170
APR	.	.	1.190	.
	1.140	1.150	1.180	1.180
MAY	1.150	1.140	1.180	1.160
JUN	1.240	1.270	1.270	1.240
JUL	.	.	1.060	1.080
AUG	1.020	1.020	1.060	1.060
SEP	1.060	1.040	.	.
OCT	.980	1.080	1.120	1.100
NOV	1.060	1.060	1.100	1.080
DEC	1.120	1.140	1.160	1.160
<hr/>				
HARDNESS (MG/L)		DET'N LIMIT = .500		GUIDELINE = 80-100 (A4)
MAR	23.500	23.500	.	23.000
APR	.	.	25.000	.
	25.500	23.000	24.000	24.000
MAY	ICR	23.000	16.000	23.000
JUN	22.000	21.000	22.000	21.000
JUL	.	.	22.000	21.000
AUG	23.000	23.000	28.000	28.000
SEP	30.000	29.000	.	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
	STANDING	FREE FLOW	STANDING	FREE FLOW	
OCT	28.000	26.000	27.000	25.000	
NOV	25.000	25.000	23.000	24.000	
DEC	21.000	20.000	21.000	20.000	

MAGNESIUM (MG/L)	DET'N LIMIT = .050		GUIDELINE = 30. (F2)		
MAR	1.800	1.800	.	1.800	
APR	.	.	1.900	.	
	2.000	1.700	1.700	1.800	
MAY	1.800	1.900	1.800	1.700	
JUN	1.600	1.600	1.700	1.700	
JUL	.	.	1.700	1.800	
AUG	1.600	1.600	2.100	2.100	
SEP	1.900	1.900	.	.	
OCT	2.000	1.800	1.900	1.700	
NOV	1.600	1.700	1.600	1.700	
DEC	1.800	1.700	1.700	1.700	

SODIUM (MG/L)	DET'N LIMIT = .200		GUIDELINE = 200. (C3)		
MAR	16.800	16.700	.	15.800	
APR	.	.	16.300	.	
	13.400	13.300	13.700	13.300	
MAY	14.000	13.200	11.800	13.400	
JUN	13.600	13.400	13.200	13.200	
JUL	.	.	12.800	12.800	
AUG	13.000	14.000	13.400	13.000	
SEP	15.000	14.600	.	.	
OCT	13.600	13.200	13.600	13.400	
NOV	11.600	11.200	11.600	11.400	
DEC	12.400	12.200	12.400	12.200	

AMMONIUM TOTAL (MG/L)	DET'N LIMIT = 0.002		GUIDELINE = .05 (F2)		
MAR	.024	.004 <T	.	BDL	
APR	.	.	.052	.	
	.032	.004 <T	.056	.004 <T	
MAY	.014	.008 <T	.022	.006 <T	
JUN	.048	.008 <T	.040	.008 <T	
JUL	.	.	.028	.018	
AUG	.004 <T	.006 <T	.064	.006 <T	
SEP	.054	.016	.	.	
OCT	.014	.004 <T	.082	.008 <T	
NOV	.050	.004 <T	.056	.002 <T	
DEC	.060	.014	ISM	ISM	

NITRITE (MG/L)	DET'N LIMIT = 0.001		GUIDELINE = 1.000 (A1)		

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING	FREE FLOW	STANDING	FREE FLOW		
MAR	.006	.009	.	.001	<T
APR	.	.	.002 <T	.	.
	.002 <T	.001 <T	.001 <T	.001	<T
MAY	.002 <T	.002 <T	.002 <T	.002	<T
JUN	.005	.006	.005	.004	<T
JUL	.	.	.001 <T	.001	<T
AUG	BDL	.004 <T	.004 <T	.005	.
SEP	.005	.004 <T	.	.	.
OCT	.002 <T	.001 <T	.002 <T	.002	<T
NOV	.001 <T	BDL	.001 <T	BDL	.
DEC	.001 <T	.001 <T	ISM	ISM	.

TOTAL NITRATES (MG/L)		DET'N LIMIT = .020		GUIDELINE = 10.000 (A1)	
MAR	.370	.360	.	.330	.
APR	.	.	.350	.	.
	.285	.265	.330	.270	.
MAY	.280	.265	.280	.265	.
JUN	.300	.260	.275	.260	.
JUL	.	.	.295	.290	.
AUG	.280	.285	.345	.290	.
SEP	.390	.350	.	.	.
OCT	.285	.250	.370	.275	.
NOV	.275	.205	.235	.205	.
DEC	.285	.235	ISM	ISM	.

NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = .020		GUIDELINE = N/A	
MAR	.360	.170	.	.210	.
APR	.	.	.690	.	.
	.210	.130	.290	.080	<T
MAY	.180	.140	.190	.120	.
JUN	.320	.160	.270	.240	.
JUL	.	.	.240	.130	.
AUG	.180	.150	.290	.150	.
SEP	.310	.190	.	.	.
OCT	.220	.190	.450	.200	.
NOV	.260	.180	.440	.140	.
DEC	.380	.270	.300	.230	.

PH (DMSNLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5(A4)	
MAR	7.620	7.670	.	7.620	.
APR	.	.	7.690	.	.
	7.710	7.760	7.730	7.750	.
MAY	7.760	7.680	7.730	7.800	.
JUN	7.610	7.750	7.730	7.760	.

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
	SITE 1		SITE 2		
	STANDING	FREE FLOW	STANDING	FREE FLOW	
JUL	.	.	7.550	7.640	
AUG	7.680	7.720	7.630	7.590	
SEP	7.690	7.700	.	.	
OCT	7.410	7.410	7.450	7.470	
NOV	7.340	7.380	7.390	7.450	
DEC	7.590	7.630	7.620	7.640	

RESIDUE (TOTAL) (MG/L)			DET'N LIMIT = 1.		GUIDELINE = 500. (A3)
MAR	90 CRO	88 CRO	.	87 CRO	
APR	.	.	93 CRO	.	
	78 CRO	77 CRO	79 CRO	77 CRO	
MAY	81 CRO	77 CRO	75 CRO	79 CRO	
JUN	79 CRO	76 CRO	77 CRO	75 CRO	
JUL	.	.	77 CRO	77 CRO	
AUG	ISM	ISM	77 CRO	76 CRO	
SEP	82 CRO	79 CRO	.	.	
OCT	75 CRO	73 CRO	77 CRO	75 CRO	
NOV	71 CRO	69 CRO	71 CRO	70 CRO	
DEC	76 CRO	74 CRO	74 CRO	74 CRO	

TURBIDITY (FTU)			DET'N LIMIT = .02		GUIDELINE = 1.00 (A1)
MAR	.840	.800	.	1.040	
APR	.	.	.850	.	
	1.220	.950	.530	.460	
MAY	.500	.300	.420	.250	
JUN	.370	.390	.400	.300	
JUL	.	.	.510	.540	
AUG	.570	.370	.600	.350	
SEP	.480	.300	.	.	
OCT	.270	.240	.410	.220	
NOV	.420	.410	.550	.310	
DEC	.510	.310	.360	.230	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING	FREE FLOW	STANDING	FREE FLOW		
<hr/>					
METALS					
ALUMINUM (MG/L)		DET'N LIMIT = .004	GUIDELINE = .10	(A4)	
MAR	.042	.041	.	.042	
APR	.	.	.035	.	
	.017	.017	.038	.016	
MAY	.018	.017	.009	BDL	
JUN	.010	.010	.006	.019	
JUL	.	.	.011	.009	
AUG	.008	ISM	.006	.007	
SEP	.015	.010	.	.	
OCT	.010	.011	.019	.010	
NOV	.007	!IS	.009	.006	
DEC	.027	.010	.017	.003	
<hr/>					
ARSENIC (MG/L)		DET'N LIMIT = 0.001	GUIDELINE = .050	(A1)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	BDL	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	BDL	
JUL	.	.	BDL	BDL	
AUG	BDL	.001	BDL	BDL	
SEP	BDL	BDL	.	.	
OCT	BDL	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	BDL	
<hr/>					
BARIUM (MG/L)		DET'N LIMIT = 0.001	GUIDELINE = 1.000	(A1)	
MAR	.016	.015	.	.015	
APR	.	.	.017	.	
	.015	.014	.016	.014	
MAY	.015	.014	.015	.011	
JUN	.018	.017	.015	.017	
JUL	.	.	.016	.015	
AUG	.013	ISM	.017	.016	
SEP	.014	.014	.	.	
OCT	.013	.013	.015	.013	
NOV	.012	!IS	.012	.012	
DEC	.013	.013	.012	.013	
<hr/>					
BORON (MG/L)		DET'N LIMIT = 0.01	GUIDELINE = 5.000	(A1)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	BDL	BDL	BDL	BDL	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING	FREE FLOW	STANDING	FREE FLOW		
MAY	BDL	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	.020 <T	
JUL	.	.	BDL	BDL	
AUG	ISM	ISM	BDL	BDL	
SEP	BDL	.010 <T	.	.	
OCT	.010 <T	BDL	BDL	.010 <T	
NOV	.026 <T	.019 <T	.017 <T	.015 <T	
DEC	.016 <T	.012 <T	.011 <T	.020 <T	

BERYLLIUM (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = .0002 (H)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	BDL	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	BDL	
JUL	.	.	BDL	BDL	
AUG	.001	ISM	BDL	BDL	
SEP	BDL	BDL	.	.	
OCT	BDL	BDL	BDL	BDL	
NOV	BDL	!IS	BDL	BDL	
DEC	BDL	BDL	BDL	BDL	

CADMIUM (UG/L)		DET'N LIMIT = 0.300		GUIDELINE = 5.000 (A1)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	.500	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	BDL	
JUL	.	.	BDL	BDL	
AUG	.300	ISM	BDL	BDL	
SEP	BDL	BDL	.	.	
OCT	.800	BDL	BDL	BDL	
NOV	BDL	!IS	BDL	BDL	
DEC	.400	BDL	BDL	BDL	

COBALT (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = 1.0 (H)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	BDL	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	BDL	
JUN	.002	.001	.001	BDL	
JUL	.	.	BDL	BDL	
AUG	.001	ISM	BDL	BDL	
SEP	BDL	BDL	.	.	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING	FREE FLOW	STANDING	FREE FLOW		
OCT	BDL	BDL	BDL	BDL	
NOV	BDL	!!S	BDL	BDL	
DEC	BDL	BDL	BDL	BDL	
<hr/>					
CHROMIUM (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = .05 (A1)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	BDL	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	BDL	
JUL	.	.	BDL	BDL	
AUG	.001	!SM	BDL	BDL	
SEP	BDL	BDL	.	.	
OCT	BDL	BDL	BDL	BDL	
NOV	BDL	!!S	BDL	BDL	
DEC	.001	BDL	BDL	BDL	
<hr/>					
COPPER (MG/L)		DET'N LIMIT = .001		GUIDELINE = 1.0 (A3)	
MAR	.091	.017	.	.020	
APR	.	.	.140	.	
	.110	.017	.120	.020	
MAY	.093	.016	.110	.012	
JUN	.150	.025	.130	.021	
JUL	.	.	.130	.031	
AUG	.600	!SM	.280	.048	
SEP	.110	.025	.	.	
OCT	.098	.034	.210	.031	
NOV	.051	!!S	.110	.018	
DEC	.130	.023	.047	.016	
<hr/>					
IRON (MG/L)		DET'N LIMIT = .002		GUIDELINE = .300 (A3)	
MAR	.140	.150	.	.140	
APR	.	.	.200	.	
	.087	.110	.086	.090	
MAY	.060	.070	.080	.100	
JUN	.094	.100	.081	.130	
JUL	.	.	.150	.120	
AUG	.032	!SM	.065	.087	
SEP	.015	.100	.	.	
OCT	.058	.150	.110	.018	
NOV	.120	!!S	.087	.081	
DEC	.120	.150	.055	.056	
<hr/>					
MERCURY (UG/L)		DET'N LIMIT = 0.010		GUIDELINE = 1.000 (A1)	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING	FREE FLOW	STANDING	FREE FLOW		
MAR	.	BDL	.	BDL	
APR	.	BDL	.	BDL	
MAY	.	BDL	.	BDL	
JUN	.	.010	.	.010	
JUL020	
AUG	.	.010	.	.020	
SEP	.	BDL	.	.	
OCT	.	BDL	.	.020	
NOV	.	.270	.	.020	
DEC	.	.010	.	.030	
<hr/>					
MANGANESE (MG/L)		DET'N LIMIT = .001		GUIDELINE = .050 (A3)	
MAR	.009	.009	.	.008	
APR	.	.	.008	.	
	.007	.008	.007	.007	
MAY	.008	.008	.005	.006	
JUN	.008	.009	.005	.006	
JUL	.	.	.007	.006	
AUG	.006	! SM	.006	.006	
SEP	.007	.008	.	.	
OCT	.008	.008	.006	.005	
NOV	.008	! IS	.005	.007	
DEC	.009	.009	.004	.004	
<hr/>					
MOLYBDENUM (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = .50 (H)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	BDL	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	BDL	
JUL	.	.	BDL	BDL	
AUG	.001	! SM	BDL	BDL	
SEP	BDL	BDL	.	.	
OCT	BDL	BDL	BDL	BDL	
NOV	BDL	! IS	BDL	BDL	
DEC	BDL	BDL	BDL	BDL	
<hr/>					
NICKEL (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = .05 (F3)	
MAR	.003	BDL	.	BDL	
APR	.	.	.002	.	
	.005	BDL	.004	BDL	
MAY	.007	BDL	.002	BDL	
JUN	.034	.002	.002	BDL	
JUL	.	.	.003	BDL	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING	FREE FLOW	STANDING	FREE FLOW		
AUG	.240	ISM	.063	BDL	
SEP	.005	BDL	.	.	
OCT	.013	.004	.001	BDL	
NOV	.013	!IS	.004	BDL	
DEC	.017	BDL	.003	BDL	

LEAD (MG/L)		DET'N LIMIT = 0.003		GUIDELINE = .050 (A1)	
MAR	.020	.004	.	BDL	
APR	.	.	.005	.	
	.028	.004	BDL	BDL	
MAY	.028	BDL	BDL	.005	
JUN	.069	.015	.009	.005	
JUL	.	.	BDL	BDL	
AUG	.460	ISM	.003	BDL	
SEP	.020	BDL	.	.	
OCT	.021	.005	.007	BDL	
NOV	.029	!IS	BDL	BDL	
DEC	.018	BDL	.004	BDL	

SELENIUM (MG/L)		DET'N LIMIT = 0.001		GUIDELINE = .010 (A1)	
MAR	BDL	BDL	.	BDL	
APR	.	.	BDL	.	
	BDL	BDL	BDL	BDL	
MAY	BDL	BDL	BDL	BDL	
JUN	BDL	BDL	BDL	BDL	
JUL	.	.	BDL	BDL	
AUG	.001	.001	BDL	BDL	
SEP	BDL	BDL	.	.	
OCT	BDL	BDL	BDL	BDL	
NOV	BDL	BDL	BDL	BDL	
DEC	BDL	BDL	BDL	BDL	

STRONTIUM (MG/L)		DET'N LIMIT = .001		GUIDELINE = 2.00 (H)	
MAR	.049	.047	.	.048	
APR	.	.	.050	.	
	.045	.045	.046	.045	
MAY	.049	.049	.047	.047	
JUN	.048	.046	.051	.047	
JUL	.	.	.045	.045	
AUG	.041	ISM	.044	.046	
SEP	.046	.045	.	.	
OCT	.038	.038	.042	.039	
NOV	.038	!IS	.042	.040	
DEC	.044	.043	.047	.042	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

	SITE 1		SITE 2	
	STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>				
URANIUM (UG/L)	DET'N LIMIT = .02		GUIDELINE = 20. (A2)	
MAR	.010	.040	.	.010
APR	.	.	.010	.
	BDL	BDL	BDL	BDL
MAY	.010	.010	.010	.070
JUN	BDL	BDL	.030	BDL
JUL	.	.	.030	.050
AUG	!IS	!SM	BDL	BDL
SEP	.020	.010	.	.
OCT	BDL	BDL	BDL	BDL
NOV	BDL	BDL	BDL	BDL
DEC	BDL	BDL	BDL	BDL
<hr/>				
VANADIUM (MG/L)	DET'N LIMIT = .001		GUIDELINE = .10 (H)	
MAR	BDL	BDL	.	BDL
APR	.	.	BDL	.
	BDL	BDL	BDL	BDL
MAY	BDL	BDL	BDL	BDL
JUN	BDL	BDL	BDL	BDL
JUL	.	.	BDL	BDL
AUG	.001	!SM	BDL	BDL
SEP	BDL	BDL	.	.
OCT	BDL	BDL	BDL	BDL
NOV	BDL	!IS	BDL	BDL
DEC	BDL	BDL	BDL	BDL
<hr/>				
ZINC (MG/L)	DET'N LIMIT = .001		GUIDELINE = 5.00 (A3)	
MAR	.011	.006	.	.009
APR	.	.	.017	.
	.021	.010	.017	.010
MAY	.020	.009	.011	.008
JUN	.025	.013	.023	.059
JUL	.	.	.027	.014
AUG	.240	!SM	.031	.019
SEP	.020	.013	.	.
OCT	.025	.015	.025	.015
NOV	.015	!IS	.012	.007
DEC	.023	.008	.014	.007

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT		DISTRIBUTION SYSTEM	
SITE 1		SITE 2	
STANDING	FREE FLOW	STANDING	FREE FLOW
CHLOROAROMATICS			
135 TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000	GUIDELINE = 10000. (D4)
MAR	BDL	.	BDL
APR	10.000 <T	.	BDL
MAY	BDL	.	BDL
JUN	BDL	.	BDL
JUL	.	.	BDL
AUG	!NR	.	BDL
SEP	BDL	.	.
OCT	BDL	.	BDL
NOV	BDL	.	.
DEC	BDL	.	BDL
HEXACHLOROETHANE (NG/L)			
		DET'N LIMIT = 1.000	GUIDELINE = 1900. (D4)
MAR	BDL	.	BDL
APR	5.000 <T	.	1.000 <T
MAY	3.000 <T	.	3.000 <T
JUN	BDL	.	BDL
JUL	.	.	BDL
AUG	!NR	.	BDL
SEP	BDL	.	.
OCT	BDL	.	BDL
NOV	BDL	.	.
DEC	BDL	.	BDL
236 TRICHLOROTOLUENE (NG/L)			
		DET'N LIMIT = 5.000	GUIDELINE = N/A
MAR	BDL	.	BDL
APR	9.000 <T	.	BDL
MAY	BDL	.	BDL
JUN	BDL	.	BDL
JUL	.	.	BDL
AUG	!NR	.	BDL
SEP	BDL	.	.
OCT	BDL	.	BDL
NOV	BDL	.	.
DEC	BDL	.	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

SITE 1		SITE 2	
STANDING	FREE FLOW	STANDING	FREE FLOW

PESTICIDES & PCB			
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 700. (G)
MAR	. 2.000 <T	. 2.000 <T	
APR	. 3.000 <T	. 2.000 <T	
MAY	. 2.000 <T	. 2.000 <T	
JUN	. BDL	. 3.000 <T	
JUL	. .	. 4.000 <T	
AUG	. !NR	. 2.000 <T	
SEP	. 3.000 <T	. .	
OCT	. 1.000 <T	. 1.000 <T	
NOV	. 2.000 <T	. .	
DEC	. 2.000 <T	. 2.000 <T	

LINDANE (NG/L)		DET'N LIMIT = 1.000	GUIDELINE = 4000.0 (A1)
MAR	. BDL	. BDL	
APR	. 1.000 <T	. BDL	
MAY	. BDL	. BDL	
JUN	. BDL	. 1.000 <T	
JUL	. .	. BDL	
AUG	. !NR	. BDL	
SEP	. 1.000 <T	. .	
OCT	. BDL	. BDL	
NOV	. BDL	. .	
DEC	. BDL	. BDL	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

SITE 1		SITE 2	
STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>			
VOLATILES			
BENZENE (UG/L)		DET'N LIMIT = 0	GUIDELINE = 5.0 (D1)
MAR	.	BDL	BDL
APR	.	BDL	BDL
MAY	.	BDL	BDL
JUN	.	BDL	BDL
JUL	.	.	BDL
AUG	.	BDL	BDL
SEP	.	.150 <T	.
OCT	.	BDL	BDL
NOV	.	.050 <T	.050 <T
DEC	.	BDL	BDL
<hr/>			
TOLUENE (UG/L)		DET'N LIMIT = 0	GUIDELINE = 100.0 (G)
MAR	.	BDL	BDL
APR	.	BDL	BDL
MAY	.	BDL	BDL
JUN	.	BDL	BDL
JUL	.	.	BDL
AUG	.	BDL	BDL
SEP	.	BDL	.
OCT	.	BDL	BDL
NOV	.	.200 UCS	.150 UCS
DEC	.	BDL	BDL
<hr/>			
ETHYLBENZENE (UG/L)		DET'N LIMIT = 0	GUIDELINE = 3400. (D3)
MAR	.	BDL	BDL
APR	.	BDL	BDL
MAY	.	BDL	BDL
JUN	.	BDL	BDL
JUL	.	.	BDL
AUG	.	BDL	BDL
SEP	.	BDL	.
OCT	.	BDL	.100 <T
NOV	.	.050 <T	.050 <T
DEC	.	BDL	.050 <T
<hr/>			
P-XYLENE (UG/L)		DET'N LIMIT = 0	GUIDELINE = 620. (G)
MAR	.	BDL	BDL
APR	.	BDL	BDL
MAY	.	BDL	BDL
JUN	.	BDL	BDL
JUL	.	.	BDL
AUG	.	BDL	BDL

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

SITE 1		SITE 2	
STANDING	FREE FLOW	STANDING	FREE FLOW
<hr/>			
SEP	.	BDL	.
OCT	.	BDL	BDL
NOV	.	.000 RMP	.000 RMP
DEC	.	BDL	BDL
<hr/>			
M-XYLENE (UG/L)		DET'N LIMIT = 0	GUIDELINE = 620. (G)
MAR	.	BDL	BDL
APR	.	BDL	BDL
MAY	.	BDL	BDL
JUN	.	BDL	BDL
JUL	.	.	BDL
AUG	.	BDL	BDL
SEP	.	BDL	.
OCT	.	BDL	BDL
NOV	.	.100 <T	.100 <T
DEC	.	BDL	BDL
<hr/>			
O-XYLENE (UG/L)		DET'N LIMIT = 0	GUIDELINE = 620. (G)
MAR	.	BDL	BDL
APR	.	BDL	BDL
MAY	.	BDL	BDL
JUN	.	BDL	BDL
JUL	.	.	BDL
AUG	.	BDL	BDL
SEP	.	BDL	.
OCT	.	BDL	BDL
NOV	.	.050 <T	BDL
DEC	.	BDL	BDL
<hr/>			
CHLOROFORM (UG/L)		DET'N LIMIT = 0	GUIDELINE = 350.0 (A1+)
MAR	.	49.000	47.000
APR	.	55.000	46.000
MAY	.	60.300	57.100
JUN	.	51.900	47.000
JUL	.	.	46.700
AUG	.	37.800	42.100
SEP	.	46.000	.
OCT	.	57.800	48.400
NOV	.	55.000	55.000
DEC	.	47.600	57.000
<hr/>			
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0	GUIDELINE = 350.0 (A1+)
MAR	.	4.000	4.000

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT				DISTRIBUTION SYSTEM	
SITE 1		SITE 2			
STANDING		FREE FLOW	STANDING		FREE FLOW

APR	.	4.000	.	4.000	
MAY	.	4.700	.	4.400	
JUN	.	4.100	.	3.700	
JUL	.	.	.	3.800	
AUG	.	3.900	.	4.200	
SEP	.	4.000	.	.	
OCT	.	5.100	.	4.500	
NOV	.	5.250	.	5.600	
DEC	.	4.800	.	5.200	

CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0		GUIDELINE = 350.0 (A1+)	
MAR	.	BDL	.	BDL	
APR	.	1.000	.	1.000	
MAY	.	BDL	.	BDL	
JUN	.	BDL	.	BDL	
JUL	.	.	.	BDL	
AUG	.	BDL	.	BDL	
SEP	.	BDL	.	.	
OCT	.	BDL	.	.100 <T	
NOV	.	.100 <T	.	.100 <T	
DEC	.	BDL	.	BDL	

1,4 DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0		GUIDELINE = 75.0 (D1)	
MAR	.	BDL	.	BDL	
APR	.	BDL	.	BDL	
MAY	.	BDL	.	BDL	
JUN	.	BDL	.	BDL	
JUL	.	.	.	BDL	
AUG	.	BDL	.	BDL	
SEP	.	BDL	.	.	
OCT	.	BDL	.	.100 UCS	
NOV	.	BDL	.	BDL	
DEC	.	BDL	.	BDL	

1,3 DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0		GUIDELINE = 130. (G)	
MAR	.	BDL	.	BDL	
APR	.	BDL	.	BDL	
MAY	.	BDL	.	BDL	
JUN	.	BDL	.	BDL	
JUL	.	.	.	BDL	
AUG	.	BDL	.	BDL	
SEP	.	BDL	.	.	
OCT	.	BDL	.	.100 UCS	
NOV	.	BDL	.	BDL	

TABLE 5

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

WATER TREATMENT PLANT

DISTRIBUTION SYSTEM

SITE 1		SITE 2	
STANDING	FREE FLOW	STANDING	FREE FLOW
DEC	BDL		BDL
1,2 DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0	
		GUIDELINE = 130. (G)	
MAR	BDL		BDL
APR	BDL		BDL
MAY	BDL		BDL
JUN	BDL		BDL
JUL			BDL
AUG	BDL		BDL
SEP	BDL		
OCT	BDL		.100 UCS
NOV	BDL		BDL
DEC	BDL		BDL
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0	
		GUIDELINE = 350.0 (A1)	
MAR	53.000		51.000
APR	60.000		51.000
MAY	65.000		61.500
JUN	56.000		50.700
JUL			50.500
AUG	41.700		46.300
SEP	50.000		
OCT	62.900		53.000
NOV	60.250		60.700
DEC	52.400		62.200

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN	PARAMETER	ANALYSED	DETECTION LIMIT	GUIDELINE
----	-----	-----	-----	-----
CHEMISTRY (LAB)	CYANIDE	18	0.001	.200 (A1) MG/L
CHLOROAROMATICS	HEXACHLOROBUTADIENE	17	1.000	450. (D4) NG/L
	123 TRICHLOROBENZENE	17	5.000	10000. (I) NG/L
	1234 T-CHLOROBENZENE	17	1.000	10000. (I) NG/L
	1235 T-CHLOROBENZENE	17	1.000	10000. (I) NG/L
	124 TRICHLOROBENZENE	17	5.000	10000. (I) NG/L
	1245 T-CHLOROBENZENE	17	1.000	38000. (D4) NG/L
	OCTACHLOROSTYRENE	17	1.000	N/A NG/L
	PENTACHLOROBENZENE	17	1.000	74000. (D4) NG/L
	245 TRICHLOROTOLUENE	17	5.000	N/A NG/L
	26A TRICHLOROTOLUENE	17	5.000	N/A NG/L
PESTICIDES & PCB	ALDRIN	17	1.000	700.0 (A1) NG/L
	BETA BHC	17	1.000	300. (G) NG/L
	ALPHA CHLORDANE	17	2.000	7000.0 (A1) NG/L
	GAMMA CHLORDANE	17	2.000	7000.0 (A1) NG/L
	DIELDRIN	17	2.000	700.0 (A1) NG/L
	METHOXYCHLOR	17	5.000	100000. (A1) NG/L
	THIODAN I	17	2.000	74000. (D4) NG/L
	THIODAN II	17	4.000	74000. (D4) NG/L
	ENDRIN	17	4.000	200.0 (A1) NG/L
	THIODAN SULPHATE	17	4.000	N/A NG/L
	HEPTACHLOR EPOXIDE	17	1.000	3000.0 (A1) NG/L
	HEPTACHLOR	17	1.000	3000.0 (A1) NG/L
	MIREX	17	5.000	N/A NG/L
	OXYCHLORDANE	17	2.000	N/A NG/L
	OPDDT	17	5.000	30000. (A1) NG/L
	PCB	17	20.000	3000. (A2) NG/L
	PP-DDD	17	5.000	N/A NG/L
	PPDDE	17	1.000	30000. (A1) NG/L
	PPDDT	17	5.000	30000. (A1) NG/L
	ATRATONE	18	50.	N/A NG/L
	ALACHLOR	18	500.	35000. (D2) NG/L
	ETHYLENE DIBROMIDE	18	0	50.0 (G) UG/L
	HCB	17	1.000	10.0 (C1) NG/L
SPECIFIC PESTICIDES	TOXAPHENE	17	N/A	5000. (A1) NG/L
	AMETRYNE	18	50.00	300000. (D3) NG/L
	ATRAZINE	18	50.00	60000. (B3) NG/L
	BLADAX	18	100.00	10000. (B3) NG/L
	PROMETONE	18	50.00	52500. (D3) NG/L
	PROPACINE	18	50.00	16000. (D2) NG/L
	PROMETRYNE	18	50.00	1000. (B3) NG/L
	SENCOR	18	100.00	80000. (B2) NG/L
	SIMAZINE	18	50.00	10000. (B3) NG/L
	METOLACHLOR	18	500.	50000. (B3) NG/L
VOLATILES	1,1 DICHLOROETHYLENE	18	0	7.0 (D1) UG/L
	DICHLOROMETHANE	18	0	1750. (D3) UG/L
	T1,2DICHLOROETHYLENE	18	0	350. (D3) UG/L

TABLE 6

DRINKING WATER SURVEILLANCE PROGRAM NORTH BAY (TROUT LAKE) W.T.P. 1987

COUNT OF PARAMETERS NOT FOUND ABOVE THE DETECTION LIMIT

SCAN ----	PARAMETER -----	ANALYSED -----	DETECTION LIMIT -----	GUIDELINE -----
VOLATILES	1,1 DICHLOROETHANE	18	0	N/A UG/L
	111, TRICHLOROETHANE	18	0	200. (D1) UG/L
	1,2 DICHLOROETHANE	18	0	5.0 (D1) UG/L
	CARBON TETRACHLORIDE	18	0	5.0 (D1) UG/L
	1,2 DICHLOROPROPANE	18	0	10.0 (G) UG/L
	TRICHLOROETHYLENE	18	0	5.0 (D1) UG/L
	112 TRICHLOROETHANE	18	0	.60 (D4) UG/L
	T-CHLOROETHYLENE	18	0	10.0 (C2) UG/L
	BROMOFORM	18	0	350.0 (A1+) UG/L
	1122 T-CHLOROETHANE	18	0	0.17 (D4) UG/L
	CHLOROBENZENE	18	0	1510. (D3) UG/L
	TRIFLUOROCHLOROTOLUE	18	0	N/A UG/L

Appendix A

DRINKING WATER SURVEILLANCE PROGRAM

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality,
- a flagging mechanism for 'Objective' exceedence,
- a definition of contaminant levels and trends,
- a comprehensive background for remedial action,
- a framework for assessment of new contaminants,
- and an indication of treatment efficiency of plant processes.

Program

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario; currently 44 plants are being monitored. Water supply locations have been prioritized for surveillance, based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit. It is estimated that after 4 years of operation, the program will be monitoring 90 locations.

A major goal of the program is to collect valid water quality data, in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analysed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling in order to acquire complete plant process and distribution system details, and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of the raw (ambient water) and the treated water at the treatment plant, and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled.

Sampling is carried out by operational personnel who have been trained in the applicable procedures.

Comprehensive standardized procedures and Field Test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". All laboratory analyses are carried out by the MOE Laboratory Services Branch.

Data Reporting Mechanism

When the analytical results are transferred from the MOE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOE District Officer, the appropriate operational staff and are also retained by the DWSP co-ordinator.

DWSP INPUTS AND OUTPUTS

The DWSP INPUTS and OUTPUTS are illustrated in Fig. 1.

PROGRAM INPUTS

PLANT AND DISTRIBUTION SYSTEM DESCRIPTION

The system description includes plant specific non-analytical information acquired through a questionnaire and initial plant visit. During the initial assessment of the plant and distribution system the questionnaire content is verified and

missing information added. It is intended that all data be kept current with scheduled annual updates.

The PLANT and DISTRIBUTION SYSTEM DESCRIPTION consists of the following seven components.

1. Process component inventory

All physical and chemical processes that the water is subjected to, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. Treatment chemicals

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. The chemical dosages applied on the day of sampling are recorded in DWSP.

3. Process control measurements

Documentation of in-plant monitoring of process parameters (turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. In-plant monitoring results are generally not retained in DWSP but are retained by the Water Treatment Plant.

4. Design flow and retention time

The hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. The maximum, minimum and average flow as well as a record of the flow rate on the day of sampling are recorded in DWSP.

5. Distribution system description

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. Sampling system

Each plant is assessed for its adequacy in terms of sampling of bacteriological, organic and inorganic parameters. The prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area;
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap), pump characteristics (model, type, capacity) and flow rate.

7. People

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate Ministry of Environment personnel associated with the plant.

FIELD DATA

The second major input to DWSP is field data.

Field data is collected at the plant and from the distribution system sites on the day of sampling. The field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling as well as monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analysed according to standardized DWSP protocols to allow for interplant comparison.

LABORATORY ANALYTICAL DATA

The third major input to DWSP is Laboratory Analytical Data.

Samples gathered from the raw, treated and distribution sampling sites are analyzed for approximately 160 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. The parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments parameters may be measured for in a "scan" producing some results for parameters that are not on the DWSP priority list but which may be of interest. The majority of the parameters are measured on a routine basis however, those that are technically more difficult and/or costly to analyse for are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change notation will be made and intercomparison data documented.

PARAMETER REFERENCE INFORMATION

The fourth major input to DWSP is Parameter Reference Information

This is a catalogue of information for each substance analysed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database.

An example is shown in fig. 2.

A written copy (hard version) of the Parameter Reference Information will be available in the near future and is a new and sophisticated enhancement to the DWSP.

PROGRAM OUTPUTS

There are four major program outputs, Query, Action Alert, Report Generation and the Annual Report.

QUERY

All DWSP information is easily accessed through the Query function, therefore anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOE offices is being developed by the DWSP group.

ACTION ALERTS

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the publication, Ontario Drinking Water Objectives (ISBN 0-7729-2725-1 revised 1983). This publication contains health-related Maximum Acceptable Concentrations for thirty substances. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedences at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, other agency guidelines which are documented in the Parameter Reference Information may be used. If these guidelines are exceeded the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

REPORT GENERATION

Custom reports can be generated from DWSP to meet the needs of the regions and to respond to public requests.

ANNUAL REPORTS

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG. 1

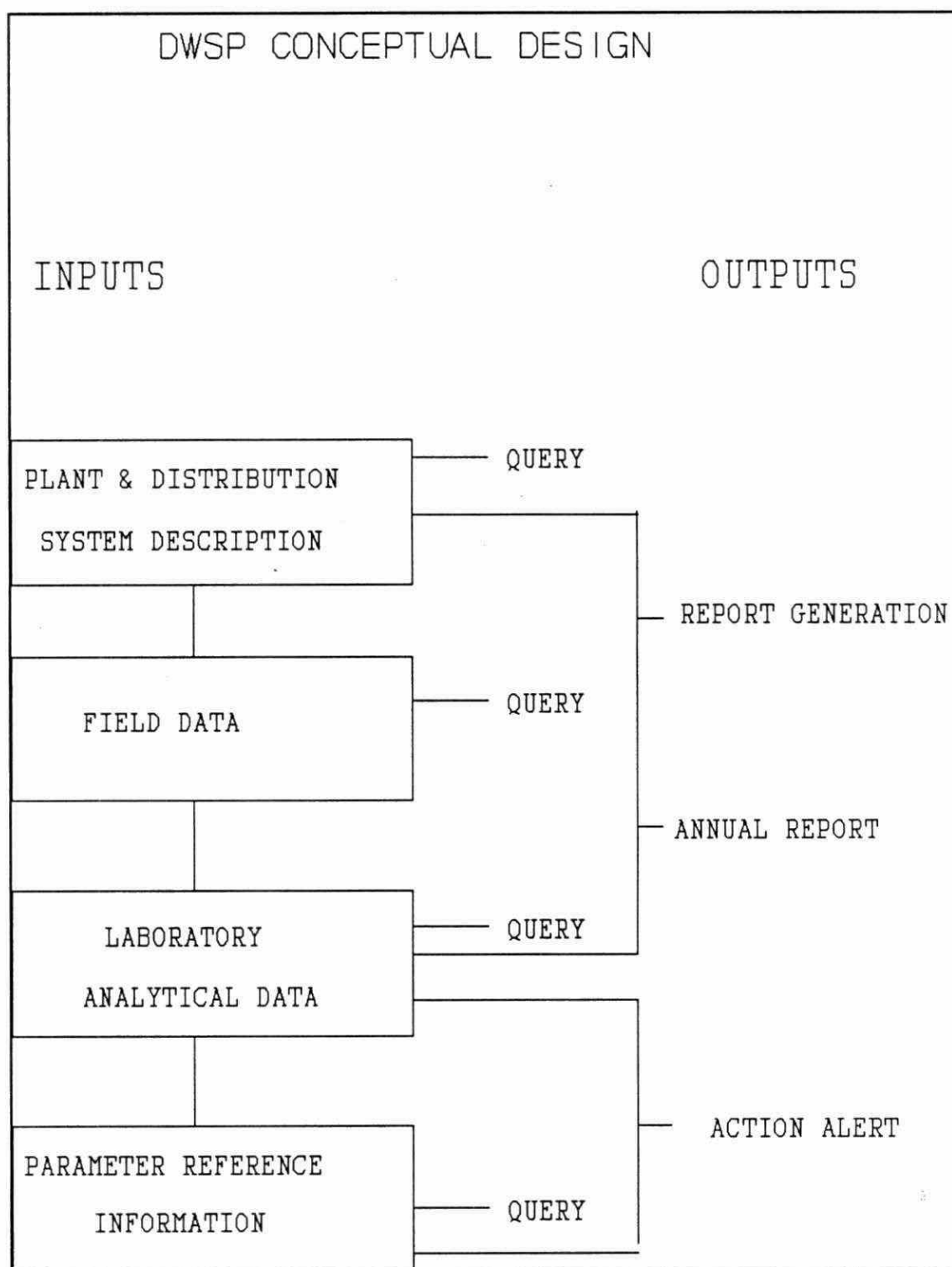


FIG.2

MOE - DRINKING WATER ASSESSMENT PROGRAM (DWSP)

(B2001P)
REFERENCE
BENZENE

PARAMETER

SOURCE	FROM	TO	METHOD	TARG	UNIT	NOTE
EPA	C 86/04		NOMETH	.00	063000 UG/L	RMCL
EPAA	C 80/11		NOMETH	6.60	063000 UG/L	
FERC	C 84/05		NOMETH	1.00	063000 UG/L	
WHO	C 84/01		NOMETH	10.00	064000 UG/L	

DESCRIPTION: NAME: BENZENE

CAS#: 71432

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 UG/L

SYNONYMS: BENZOLE, COAL NAPHTHA, CARBON OIL (27),
CYCLOHEXATRIENE (41)CHARACTERISTICS: COLOURLESS TO LIGHT YELLOW, MOBILE,
NON-POLAR LIQUID, OF HIGHLY REFRACTIVE NATURE,
AROMATIC, VAPOURS BURN WITH SMOKING FLAME (30)

PROPERTIES:

SOLUBILITY IN WATER: 1780-1800 MG/L AT 25 DEG C (41)

THRESHOLD ODOUR: NO DATA

THRESHOLD TASTE: 0.5 MG/L IN WATER (39)

ENVIRONMENTAL FATE: MAY BIOACCUMUALTE IN LIVING
ORGANISMS, APPEARS TO BIOACCUMULATE IN ANIMAL
TISSUES THAT EXHIBIT HIGH LIPID CONTENT OR ARE
MAJOR METABOLIC SITES (LIVER, BRAIN), SMALL
QUANTITIES EVAPORATE FROM SOIL OR DEGRADE QUICKLY
SOURCES: PETROLEUM REFINING, SOLVENT RECOVERY, COAL
TAR DISTILLATION, FOOD PROCESSING, TANNING.USES: PREPERATION OF ETHYL BENZENE USED AS A STYRENE
MONOMER, DETERGENTS, NYLON, AS INTERMEDIATE IN
PESTICIDE PRODUCTION, SOLVENT IN RUBBER INDUSTRY,
DEGREASING AND CLEANSING AGENT, GASOLINE.TOXICITY: RATING 4 (VERY TOXIC); ACUTE - IRRITATES
MUCOUS MEMBRANES, SYMPTONS INCLUDE RESTLESSNESS,
CONVULSIONS, DEPRESSION, RESPIRATORY FAILURE;
CHRONIC - ANEMIA AND LEUKEMIA (45).

CARINOGENICITY: HUMAN CARCINOGEN AND MUTAGEN

REMOVAL: GAC ADSORPTION, PRECIPITATION WITH ALUM
FOLLOWED BY SEDIMENTATION, COAGULATION AND
FLOCCULATION, SOLVENT EXTRACTION, OXIDATION (41).

MOLECULAR WEIGHT: 78.12 GRAMS

MELTING POINT: 5.5 DEGREES C (27)

BOILING POINT: 80.1 DEGREES C (27)

SPECIFIC GRAVITY: 0.879 AT 20 DEGREES C (27)

VAPOUR PRESSURE: 100 MM AT 26.1 DEGREES C

HENRY'S LAW CONSTANT: 0.00555 ATM M_3 /MOLE

LOG OCT./WATER PAR.COEFF:K=1.0 1/N=1.6 R=.97 PH=5.3

Appendix B

DWSP SAMPLING GUIDELINE

i) RAW and TREATED at PLANT

General Chemistry	<ul style="list-style-type: none">-500 mL clear plastic bottle-rinse bottle with sample three times and discard water-fill to line
Bacti	<ul style="list-style-type: none">-250 mL clear glass bottle with white seal on cap-do <u>not</u> rinse bottle; preservative has been added-avoid touching bottle neck or inside of cap-fill to top of red label as marked
Metals	<ul style="list-style-type: none">-500 mL clear plastic bottle with white lid-rinse bottle and cap three times, discard-fill to line-add 10 drops nitric acid (Caution: HNO_3 is corrosive)
Volatiles (OPOPUP)	<ul style="list-style-type: none">-250 mL clear glass bottle-do <u>not</u> rinse bottle-tilt bottle when filling-fill bottle completely; there should be no air bubbles.
Organic (OWOC), (OWTRI), (OAPAHX)	<ul style="list-style-type: none">-1 liter brown glass bottle per scan-do <u>not</u> rinse bottle-fill to approx. 1" from top-when 'special pesticides' are requested three extra bottles per sample must be submitted
Cyanide	<ul style="list-style-type: none">-500 mL clear plastic bottle-do <u>not</u> rinse bottle-fill to approx. 1" from top-add 10 drops sodium hydroxide (Caution: NaOH is corrosive)

Mercury

- 250 mL clear glass bottle
- rinse bottle and cap three times, discard then fill to top of label
- add 20 drops each nitric acid and potassium dichromate
- (**Caution:** HNO_3 and KCrO_7 corrosive)

Phenols

- 250 mL clear glass bottle
- do not rinse bottle
- fill to top of label as marked

Steps

1. Let cold water tap run for several minutes.
2. Record time in submission sheet.
3. Record teperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL clear plastic bottle -rinse bottle with sample three times and discard -fill to line
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (Caution: HNO_3 is corrosive)

Steps:

1. Record time on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.
5. Fill general chemistry and metals bottles.
6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL clear plastic bottle -rinse bottle with sample three times and discard water -fill to line
Bacti	-250 mL clear glass bottle with white seal on cap -do <u>not</u> rinse bottle; preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL clear plastic bottle with white lid -rinse bottle and cap three times, discard -fill to line -add 10 drops nitric acid (Caution: HNO_3 is corrosive)
Volatiles (OPOPUP)	-250 mL clear glass bottle -do <u>not</u> rinse bottle; preservative has been added -tilt bottle when filling -fill bottle completely; there should be no air bubbles
Organic (OWOC), (OWTRI)	-1 liter brown glass bottle per scan -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top
Cyanide	-500 mL clear plastic bottle -do <u>not</u> rinse bottle: preservative has been added -fill to approx. 1" from top -add 10 drops sodium hydroxide (Caution: NaOH is corrosive)
Mercury	-250 mL clear glass bottle -rinse bottle and cap three times, discard then fill to top of label -add 20 drops each nitric acid and potassium dichromate (Caution: HNO_3 and KCrO_7 corrosive)

Steps:

1. Record time on submission sheet.
2. Let cold water flow for ten minutes.
3. Record temperature on submission sheet.
4. Fill all bottles as per instructions.
5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.



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